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AGRICULTURAL NEWS LETTER

Giving information on new developments of interest to agriculture, based on the work done by chemists and technical men of the du Pont Company and its subsidiary companies.

Also news on field and agricultural experiment station work in the control of plant diseases and crop pests.

We shall be glad to send you articles on subjects in our field, written in collaboration with chemical experts, if you will write us stating what subjects you wish discussed.

Issued by du Pont Company,
Wilmington, Delaware,
F. J. Byrne, Editor.

April 19, 1934.



UREA* FOR POTATO

FERTILIZERS

*Urea is a compound of ammonia and carbon dioxide. Because it is a constituent of natural manures, it is the ideal fertilizer material. Actually du Pont synthetic urea is the same compound as exists naturally. Urea is of great interest to chemists because it is the first animal substance to be produced synthetically. Today, it is manufactured in the United States by du Pont, being marketed by du Pont as a constituent of the product, "Urea Ammonia Liquor." It is also manufactured in Germany.

Field experiments on sources of nitrogen for potato fertilizers have been conducted on prominent potato soil types in Maine, New York, Pennsylvania, Maryland, Virginia and North Carolina.

The data show that as an average of nine experiments covering a total of 39 crops, fertilizers with urea as a source of nitrogen produced an increase of 81 bushels per acre. Fertilizers with nitrate of soda and sulfate of ammonia as sources of nitrogen, produced increases of only 64 and 69 bushels per acre respectively. A fertilizer in which one half of the nitrogen was from high-grade natural organics and one half from equivalent amounts of nitrate of soda and sulfate of ammonia produced an increase of 83 bushels, almost identically the same as that produced when urea was the only source.

The Maine Agricultural Experiment Station in cooperation with the Bureau of Chemistry and Soils, United States Department of Agriculture, has conducted two sources of nitrogen experiments on Caribou loam, the leading potato soil type in Aroostook County. One test covered a period of six years and the other a period of three years.

In the first experiment Irish cobblers were used and 4-8-8 fertilizers formulated with different sources of nitrogen were applied in the furrow at the rate of 1,800 pounds per acre.

In discussing the results of this test, the Maine Agricultural Experiment Station Bulletin No. 354, 1930, states:

"From 1921 to 1926, urea gave the largest yield (313 bushels or 114 barrels per acre), which speaks well for this comparatively new fertilizer material. It is interesting to note that the yield with urea was comparatively good in 1922, when the rainfall was sufficient to cause serious leaching and also in 1921, 1923 and 1924, when drought occurred and the yield with ammonium sulfate fell below that with sodium nitrate."

Green Mountain potatoes were used in the second Maine experiment and 5-8-7 fertilizers formulated with different sources of nitrogen were applied in the furrow at the rate of 1,500 pounds per acre. The results of these tests showed a maximum difference between the fertilized plots of eleven bushels.

In New York, the Bureau of Chemistry and Soils, United States Department of Agriculture, in cooperation with Cornell University Agricultural Experiment Station, conducted two experiments on sources of nitrogen for potato fertilizers. Both experiments were conducted on Sassafras loam in Suffolk County, Long Island. The first experiment was conducted three years with Green Mountain potatoes and the second for two years with Irish cobbler potatoes. The results of these tests were similar. The plots receiving urea and urea phosphate as the only source of nitrogen averaged 15 bushels per acre more than the ammonia sulfate plot and 20 bushels more than the nitrate of soda plot.

Results of three experiments in Pennsylvania for periods of three, four and five years showed the average increase from complete fertilizers in these experiments was only 43 bushels smaller than experiments in other states. Urea and natural organics were both slightly superior to mineral sources in these experiments.

Results of a seven-year source of nitrogen experiment have been reported by F. E. Metzger and E. H. Schmidt of the Maryland Agricultural Experiment Station.

The test showed an average increase of 98 bushels of prime potatoes produced by urea as against an increase of 57 bushels produced by nitrate of soda and 78 bushels per acre produced by sulfate of ammonia. The data also show that potato fertilizers which contained urea as the only source of nitrogen gave a higher yield than those in which the nitrogen was derived from dried ground fish or a mixture of organic and inorganic sources.

Results of a four-year experiment conducted in Northampton County, Virginia, again showed urea superior to nitrate of soda and sulfate of ammonia. The relative increase produced by fertilizers formulated with these sources were 100 for urea, 71 for nitrate of soda and 93 for ammonium sulfate.

The North Carolina Experiment Station in cooperation with the United States Department of Agriculture has published the results of a five-year source of nitrogen experiment. These results show that a fertilizer with urea as the only source of nitrogen increased the yield 92 bushels per acre. A plot receiving urea and ammonium phosphate as sources of nitrogen, produced an increase of 96 bushels per acre.

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TESTS ON THE USE OF MANGANESE ARSENATE
TO CONTROL CODLING MOTHS IN CALIFORNIA

By: Dr. E. R. deOng, Consulting
Entomologist, San Francisco, Cal.

An investigation is now being made of the use of a manganese arsenate as a substitute for lead arsenate, especially for later applications on apples and pears in the control of codling moth. The advantage which manganese arsenate offers over that of lead arsenate is the complete elimination of lead as a residue on fruit, thus making it conform more easily to the Federal Food and Drug requirements. Arsenicals, as is well known, are restricted in application, but since no satisfactory substitute has been developed, it still becomes necessary to apply arsenic in combination with some element such as lead, calcium and manganese and at the same time offer the possibility of removal to the point required as a legal minimum.

There have been no general experiments with any manganese arsenate made under California conditions until last summer, hence a large series of field experiments were made to determine, first, the possibility of foliage injury and, second, the control of codling moth by comparison with standard lead arsenate. This work was principally on apples and pears in the commercial orchard districts of the state, but limited work was also done on Japanese plums and on peaches. Sufficient success was attained in this work to warrant further experimental work in view of the necessity of holding down lead residues to the minimum and for this reason Manganar will probably be tried out extensively again this year, principally on an experimental basis to determine the best means of handling same and satisfactory spray programs probably in combination with lead arsenate for the calyx and perhaps the first cover spray. The latter material is generally considered to weather better than Manganar and while the fruit is small may possibly be used, to be followed by Manganar sprays for the later cover applications as the fruit increases in size.

The experiments made in 1933 cover twelve different counties in the state and included the common commercial varieties of apples and to a less extent pears. But very few applications were made of Manganar alone for the entire spray season as supplies were unavailable until rather late in the spring.

From the standpoint of foliage injury, it was found that Manganar in no case resulted in greater injury than standard lead arsenate and in some orchards showed decidedly less burn than did the lead applications. A few spray blocks in the Sebastopol region where sulphur was combined with lead and manganese arsenate, showed foliage injury but this was probably due to sulphur rather than to the arsenicals. No injury resulted in the applications to Japanese plum in the Newcastle region, or in some very limited experiments, on orange cling near Yuba City.

The control of codling moth was in most instances entirely comparable to that of standard lead arsenate sprays. In only two or three out of nineteen experiments did lead arsenate show superior results to the manganese arsenate and in those instances varying field conditions might easily have accounted for the difference. The results of field counts in the observations of the orchardists on whose property the experiment was conducted almost invariably resulted in variations of only one to three percent in the amount of wormy fruit. Better development of color was also obtained in some of the red variety of apples than with the lead arsenate applications.

Judging from the results of the year's work, it seems probable that with further investigation manganese arsenate will be found to occupy a satisfactory place in the materials available to the orchardist in the control of codling moth particularly, and with entire freedom of danger of lead residue.

DYNAMITE FOR BLASTING

WATER HOLES FOR CATTLE

J. R. Oliver, Lafayette Co., Louisiana, has found that several craters which were formed by oil exploration blasts on his farm are serving as ideal watering holes for cattle. For a long time dynamite has been found to be an excellent agent for blasting water holes for cattle. The du Pont Company has made special studies of the use of dynamite for this purpose and literature will be sent on request.

"CEL-O-GLASS" NOW CARRIES
A FIVE-YEAR GUARANTEE

The makers of Cel-O-Glass announce a new forward step in the durability of this product. Long years of research have resulted in the perfection of a new construction based upon the use of an oval wire and a heavier coating.

This new and greatly improved Cel-O-Glass is now sold with a five-year guarantee where the material is used in accordance with the recommendations of the makers for long life. The guarantee applies to the use of Cel-O-Glass in poultry houses, on hotbed and coldframe sashes and in any installation where correct installation is employed.

"Cel-O-Glass" has been used for over a decade by hundreds of thousands of poultry raisers and leading plant growers throughout the country. The increased durability which this material now assures will be welcome news to growers and poultry men everywhere who have long recognized the merit and advantages of Cel-O-Glass over ordinary glass and other materials.

ATTRACTIVE COLOR SCHEMES
FOR ROAD-SIDE MARKETS

The automobile touring season will soon begin. It is likely that many farmers will wish to put up a road-side market in order to sell their farm products and also, perhaps, some handicraft, to passing motorists.

This Agricultural News Letter can supply a series of color schemes for road-side markets designed to attract the attention of passing motorists.

PROTECTING WILD LIFE

Conservationists point to the great and useless destruction of wild life, both game and non-game, caused by burning off farm fields in the Spring. This, of course, means the parent birds are driven away, while nests and eggs, and newly hatched birds are destroyed. Also, many of the young of rabbits are burned to death or badly injured.

Agricultural authorities call attention to the fact that, in the case of certain kinds of insectivorous birds, the destruction by fire of their nesting places and the heavy loss of life mean that the farmer has deprived himself of the services of great numbers of winged helpers in his unceasing fight against insect pests that attack and destroy growing crops.

It is further pointed out that the destruction of birds by fire can offset, in great measure, the value of the constructive efforts being made by the Federal Government to restore and increase the numbers of upland game birds, and song, insectivorous and ornamental birds.

As is generally known, Secretary of Agriculture Wallace appointed, with President Roosevelt's approval, "The President's Committee on Wild Life Restoration." This group is made up of Thomas H. Beck, game commissioner of Connecticut, chairman; Prof. Aldo Leopold, an outstanding authority on wild life; and Jay N. Darling, the noted newspaper cartoonist and also a leader in wild life restoration. Mr. Darling has been named Chief of the U. S. Biological Survey. The appointing of this committee had the approval also of the U. S. Senate Committee on Wild Life Restoration.

The group was assigned the task of drafting a comprehensive plan for restoring to former abundance and the increasing of all forms of useful native wild life. It is significant, therefore, that in the opinion of the committee members and that of many authorities consulted, the best results could be secured by establishing breeding and nesting areas.

Burning off fields that are to be put in crops is bad enough, assert qualified observers, but even greater destruction of economically valuable wild life follows the unnecessary practice of firing woodlands, meadows and swamps.

BLASTING DITCHES WITH DYNAMITE

Blasting ditches with dynamite is usually regarded as the most economical and quickest method of solving drainage problems. By loading and spacing the charges properly, a ditch can be blown out clean so that it will require very little, if any, work with a shovel. If trees, stumps, bushes or boulders are encountered along the course of the ditch, they should be loaded slightly heavier so that they will be blown out at the same time the ditch is blasted. Ditches may be blasted any size from $2\frac{1}{2}$ to 10 feet in depth and from four to twenty feet in width, depending on the method of loading and the quantity of explosives used. There are two distinct methods of blasting ditches - the propagation method and the electric method. The propagation method in which one primed cartridge in one hole detonates the other charges down the line of the ditch, can be used only in wet soils, while the electric method can be used in either wet or dry soils. The explosives and blasting supplies needed and the methods of loading vary considerably in the two methods.

Straight nitroglycerin dynamite in 50 or 60 percent strength should be used for ditching in soil that is saturated with water as in wet muck, loose loam, or for cleaning out an old ditch that has become filled with debris.

When blasting by the electrical method, a 40 percent ammonia dynamite may be used for small ditches, but for larger ditches by this method, a 60 percent ammonia dynamite or 60 percent gelatin dynamite should be used.

For a successful ditch, there must be enough slope to carry off the water from the ditch, and experience has proved that the large majority of our farm ditches do not have a proper outlet for water at the mouth of the ditch. Land which permits a good slope for a ditch can be drained with a smaller ditch than land which is practically level so that a minimum fall can be obtained.

The amount of dynamite required for each charge and the depth of the holes and spacing will depend on the size of the ditch required and the method of firing the charge. The du Pont Company is in position to give detailed and practical information on how to use dynamite in drainage work, tree planting, stumping, boulder blasting and other uses on the farm.

CONTROL OF DAMPING-OFF DISEASES

At this time, it is well to remember that when seeds are planted, they almost always carry with them, on their seed coats, the spores or germs which cause damping-off diseases, and often, the very soil upon which they depend for warmth, moisture and nourishment, contains many of the same destructive germs. These spores, so small that they can be seen only with a microscope, germinate under the same conditions of moisture and warmth required by the seed. The disease germs attack the germinating seed and frequently destroy it before it reaches the light of day, or they may delay their attack until the plant is well above the ground.

Fortunately, plant disease experts and chemists have found a chemical, chlorophenol mercury, harmless to seeds and seedlings, which will destroy disease germs on the seed and in the soil. This chemical is safe for the amateur as well as the experienced plant grower. It may be applied either in dust form or by soaking the seed in a solution of the dust in water. As a further precaution, many growers sprinkle the soil two or three times with the solution at intervals of a week or so after seedlings come up.

With the protecting aid of such a chemical, flower growers can usually get a good stand of seedlings. After the young plants are three or four weeks old, they are usually able to resist the attacks of these damping-off diseases.

SOME GARDEN AND CROP ENEMIES

AND HOW BEST TO CONTROL THEM

The damage done by insects to agriculture and garden products cannot be overestimated. In order to combat this damage an enormous amount of research work is being done in the laboratories of chemical organizations and in laboratory and field work carried on at the various agricultural experiment stations. A great deal of work is also done by the U. S. Department of Agriculture.

Important studies of certain of the most destructive and widely located insects have recently been made by Dr. Harry F. Dietz of the Ohio Agricultural Experiment Station. These studies cover the blister beetle, Mexican bean beetle and striped cucumber beetle.

This Agricultural News Letter has copies of these studies and will be glad to distribute them to anybody who wishes them. The subject is treated in a popular way. Dr. Dietz tells what the insects are, what they look like, when and where to look for them and how to control them.

If you wish to receive these studies on insects, please let us hear from you. **** EDITOR

USE OF PAINT IMPORTANT

FOR A WELL-KEPT FARM

Nothing is quite so pleasing a sight as a well-kept farm. Neat appearance depends mainly on whether the buildings are in good condition - whether they are painted and look ship shape, or are allowed to be neglected and down-at-the-heels.

Now is the time to put farm buildings in condition for the coming year. The severe winter just past has taken heavy toll of all buildings and equipment. Make them new again by painting. A few dollars invested in paint will save costly repairs later on, and will add greatly to the appearance and value of farm property.

Give houses and barns a protective coat of Prepared Paint, or use Barn and Roof Paint on the barn and other farm buildings. Protect the fences, too, with this paint. Examine the roofs carefully - a roof will give you longer service if you give it a protective coat of paint.

Farm machinery also needs protection against weather. Before rust has a chance to start, give the machinery a coat of Duco. It will add years to the service of the equipment - to say nothing of its appearance.

The inside of the house is also due for a Spring renovating. Make the woodwork fresh and attractive with Interior Gloss Enamel. The soft pleasing colors are durable and easy to keep clean. Freshen kitchen furniture with Duco. A few hours work with a paint brush and you have a new, colorful kitchen.

Paint farm buildings and equipment this Spring - before the hot weather sets in. You will be justly proud of the results.
